WHAT IS CLAIMED IS:

1. A method of forming a semiconductor on insulator structure in a monolithic semiconducting substrate with a bulk semiconductor structure, the method comprising the steps of:

recessing a first portion of a surface of the monolithic semiconducting substrate without effecting a second portion of the surface of the monolithic semiconducting substrate,

implanting an insulator precursor species beneath the surface of the recessed first portion of the monolithic semiconducting substrate,

etching a trench around the implanted and recessed first portion of the monolithic semiconducting substrate,

activating the insulator precursor species to form an insulator layer beneath the surface of the recessed first portion of the monolithic semiconducting substrate,

forming the semiconductor on insulator structure in the first portion of the monolithic semiconducting substrate, and

forming the bulk semiconductor structure in the second portion of the monolithic semiconducting substrate.

2. The method of claim 1, wherein the step of recessing the first portion of the surface of the substrate comprises the steps of:

growing a thermal oxide layer on the surface of the substrate,

depositing a nitride masking layer on the thermal oxide layer,

forming a patterning layer on the nitride masking layer,

forming openings in the patterning layer,

etching portions of the nitride masking layer and the thermal oxide layer through the openings in the patterning layer,

removing the patterning layer,

recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer, and

stripping off all material remaining on the surface of the substrate.

3. The method of claim 2, wherein the step of recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer comprises the step of:

oxidizing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer to partially consume the substrate.

4. The method of claim 3, wherein the step of oxidizing the first portion of the surface of the substrate forms an oxide layer of between about one hundred nanometers and about one thousand nanometers in thickness.

5. The method of claim 2, wherein the step of recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer comprises the step of:

etching the first portion of the surface of the substrate with an etching solution.

6. The method of claim 2, wherein the step of recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer comprises the step of:

etching the first portion of the surface of the substrate with a dry etch.

7. The method of claim 1, wherein the step of activating the insulator precursor species to form an insulator layer beneath the surface of the recessed first portion of the monolithic semiconducting substrate thereby elevates the surface of the recessed first portion of the substrate to be substantially planar with the second portion of the surface of the substrate.

8. The method of claim 1, wherein the precursor insulator species comprises oxygen.

9. The method of claim 1, wherein the precursor insulator species comprises nitrogen.

10. An integrated circuit formed according to the method of claim 1.

11. A method of forming an insulating layer below a semiconducting layer in a semiconducting substrate, the method comprising the steps of:

recessing a first portion of a surface of the substrate without effecting a second portion of the surface of the substrate,

implanting an insulator precursor species beneath the surface of the recessed first portion of the semiconducting substrate,

etching a trench around the implanted and recessed first portion of the semiconducting substrate, and

activating the insulator precursor species to form an insulator layer beneath the surface of the recessed first portion of the semiconducting substrate.

12. The method of claim 11, wherein the step of recessing the first portion of the surface of the substrate comprises the steps of:

growing a thermal oxide layer on the surface of the substrate,

depositing a nitride masking layer on the thermal oxide layer,

forming a patterning layer on the nitride masking layer,

forming openings in the patterning layer,

etching portions of the nitride masking layer and the thermal oxide layer through the openings in the patterning layer,

removing the patterning layer,

recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer, and

stripping off all material remaining on the surface of the substrate.

13. The method of claim 12, wherein the step of recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer comprises the step of:

oxidizing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer to partially consume the substrate.

14. The method of claim 13, wherein the step of oxidizing the first portion of the surface of the substrate forms an oxide layer of between about one hundred nanometers and about one thousand nanometers in thickness.

15. The method of claim 13, wherein the step of recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer comprises the step of:
etching the first portion of the surface of the substrate with an etching solution.

16. The method of claim 12, wherein the step of recessing the first portion of the surface of the substrate underlying the etched portions of the nitride masking layer and the thermal oxide layer comprises the step of:
etching the first portion of the surface of the substrate with a dry etch.

17. The method of claim 11, wherein the step of activating the insulator precursor species to form an insulator layer beneath the surface of the recessed first portion of the monolithic semiconducting substrate thereby elevates the surface of the recessed first portion of the substrate to be substantially planar with the second portion of the surface of the substrate.

18. The method of claim 11, wherein the precursor insulator species comprises oxygen.

19. The method of claim 11, wherein the precursor insulator species comprises nitrogen.

20. A monolithic integrated circuit having a semiconductor on insulator circuit structure formed in a first portion of the substrate, the first portion of the substrate having a first surface and a semiconducting layer overlying an insulating layer that extends to a depth within the substrate, the first portion of the substrate surrounded by a filled trench that extends below the depth of the insulating layer of the first portion, the integrated circuit also having a bulk semiconducting circuit structure formed in a second portion of a substrate, the second portion of

the substrate having a second surface, where the first surface is substantially coplanar with the second surface.